

Amendments to the Claims:

The following is the complete set of the claims of this application with markings to show the amendments presently submitted for entry:

WHAT IS CLAIMED IS:

- 1 **Claim 1 (currently amended):** A process for manufacturing a high-strength, high-ductility
2 alloy carbon steel, said process comprising:
3 (a) forming a carbon steel alloy having a microstructure comprising laths of
4 martensite alternating with from about 0.5% to about 15% by volume of films of retained
5 austenite, and
6 (b) cold working said carbon steel alloy to a reduction sufficient to achieve a
7 tensile strength of at least about 150 ksi.
- 1 **Claim 2 (currently amended):** The process of claim 1 wherein [A process in accordance with
2 claim 1 in which] step (b) comprises cold working said carbon steel alloy to a reduction
3 sufficient to achieve a tensile strength of from about 150 ksi to about 500 ksi.
- 1 **Claim 3 (currently amended):** The process of claim 1 wherein [A process in accordance with
2 claim 1 in which] step (b) comprises cold working said carbon steel alloy to a cross-sectional
3 area reduction of at least about 20% per pass.
- 1 **Claim 4 (currently amended):** The process of claim 1 wherein [A process in accordance with
2 claim 1 in which] step (b) comprises cold working said steel alloy to a cross-sectional area
3 reduction of at least about 25% per pass
- 1 **Claim 5 (currently amended):** The process of claim 1 wherein [A process in accordance with
2 claim 1 in which] step (b) comprises cold working said carbon steel alloy to a cross-sectional
3 area reduction of from about 25% to about 50% per pass.

1 **Claim 6 (currently amended):** The process of claim 1 wherein [A process in accordance with
2 claim 1 in which] step (b) comprises cold working said carbon steel alloy in a series of passes
3 without heat treatment between passes.

1 **Claim 7 (currently amended):** The process of claim 1 wherein [A process in accordance with
2 claim 1 in which] step (b) is performed at a temperature of about 100°C or below.

1 **Claim 8 (currently amended):** The process of claim 1 wherein [A process in accordance with
2 claim 1 in which] step (b) is performed within approximately 25°C of ambient temperature.

1 **Claim 9 (currently amended):** The process of claim 1 wherein [A process in accordance with
2 claim 1 in which] said carbon steel alloy is in the form of a rod or wire, and step (b) comprises
3 drawing said carbon steel alloy through a die.

1 **Claim 10 (currently amended):** The process of claim 1 wherein [A process in accordance with
2 claim 1 in which] said carbon steel alloy is in the form of a sheet, and step (b) comprises rolling
3 said carbon steel alloy.

1 **Claim 11 (currently amended):** The process of claim 1 wherein [A process in accordance with
2 claim 1 in which] step (a) comprises

3 (i) forming a carbon steel alloy composition having a martensite start temperature
4 of at least about 300°C,

5 (ii) heating said carbon steel alloy composition to a temperature sufficiently high
6 to cause austenitization thereof, to produce a homogeneous austenite phase with all
7 alloying elements in solution, and

8 (iii) cooling said homogeneous austenite phase through said martensite transition
9 range at a cooling rate sufficiently fast to achieve said microstructure substantially
10 avoiding carbide formation at interfaces between said laths of martensite and said films
11 of retained austenite.

1 **Claim 12 (currently amended):** The process of claim 11 wherein [A process in accordance
2 with claim 11 in which] said carbon steel alloy composition having a martensite start temperature
3 of at least about 350°C.

1 **Claim 13 (currently amended):** The process of claim 11 wherein [A process in accordance
2 with claim 11 in which] said retained austenite films are of a uniform orientation.

1 **Claim 14 (currently amended):** The process of claim 11 wherein [A process in accordance
2 with claim 11 in which] said carbon steel alloy composition consists of iron and alloying
3 elements comprising from about 0.04% to about 0.12% carbon, from 0% to about 11%
4 chromium, from 0% to about 2.0% manganese, and from 0% to about 2.0% silicon, all by
5 weight.

1 **Claim 15 (currently amended):** The process of claim 11 wherein [A process in accordance
2 with claim 11 in which] said temperature of step (ii) is from about 800°C to about 1150°C.

1 **Claim 16 (currently amended):** The process of claim 1 wherein [A process in accordance with
2 claim 1 in which] step (a) comprises

3 (i) forming a carbon steel alloy composition having a martensite start temperature
4 of at least about 300°C,

5 (ii) heating said carbon steel alloy composition to a temperature sufficiently high
6 to cause austenitization thereof, to produce a homogeneous austenite phase with all
7 alloying elements in solution,

8 (iii) cooling said homogeneous austenite phase to transform a portion of said
9 austenite phase to ferrite crystals, thereby forming a two-phase microstructure comprising
10 ferrite crystals fused with austenite crystals, and

11 (iv) cooling said two-phase microstructure through said martensite transition
12 range under conditions causing conversion of said austenite crystals to a microstructure
13 containing laths of martensite alternating with films of retained austenite.

1 **Claim 17 (currently amended):** The process of claim 16 wherein [A process in accordance
2 with claim 16 in which] in which step (iii) comprises cooling said homogeneous austenite phase
3 to a temperature of from about 800°C to about 1,000°C.

1 **Claim 18 (currently amended):** The process of claim 16 wherein [A process in accordance
2 with claim 16 in which] step (ii) comprises heating said carbon steel alloy composition to a
3 temperature of from about 1,050°C to about 1,170°C, and step (iii) comprises cooling said
4 homogeneous austenite phase to a temperature of from about 800°C to about 1,000°C.

1 **Claim 19 (currently amended):** The process of claim 16 wherein [A process in accordance
2 with claim 16 in which] said carbon steel alloy composition consists of iron and alloying
3 elements comprising from about 0.02% to about 0.14% carbon, from 0% to about 3.0% silicon,
4 from 0% to about 1.5% manganese, and from 0% to about 1.5% aluminum, all by weight.

1 **Claim 20 (new):** The process of claim 1 wherein said films of retained austenite constitute from
2 about 3% to about 10% by volume of said microstructure.

1 **Claim 21 (new):** The process of claim 1 wherein said films of retained austenite constitute from
2 about 0.5% to about 5% by volume of said microstructure.